

**In the Claims**

- 1     10. (Previously Amended) An apparatus for selectively forming a silicide  
2     comprising:  
3         a semiconductor substrate having a surface, a portion of said surface having  
4         silicon thereon and a portion of said surface having an insulator thereon, said  
5         surface further having an oxide thereover;  
6         a chamber;  
7         at least one workpiece holder within said chamber adapted to hold said  
8         substrate;  
9         at least one pump adapted to evacuate said chamber to maintain a continuous  
10        vacuum in said chamber;  
11        at least one line operatively connected between said at least one pump and said  
12        chamber for evacuating said chamber;  
13        at least one input line adapted to provide a chemical agent into said chamber  
14        while in said continuous vacuum, said chemical agent adapted to remove  
15        said oxide from said surface of said substrate;  
16        at least one output line adapted to remove said cleaning agent and said removed  
17        oxide from said chamber;

18 a reactor in said chamber, said reactor adapted to deposit a metal onto said  
19 silicon and insulator portions on said substrate surface while in said  
20 continuous vacuum;

21 a heating element, said heating element adapted to heat said substrate to an  
22 elevated temperature to form a silicide on said substrate surface over the  
23 silicon portion by reaction with the metal deposited thereon, while the metal  
24 remains unreacted over the insulator portion; and

25 an etchant to remove unreacted metal from the substrate surface while leaving  
26 said silicide over portions of said semiconductor substrate.

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1 12. (Previously Amended) The apparatus of claim 10 wherein said chamber  
2 comprises a plurality of interior chambers, at least one interior chamber adapted to  
3 remove said oxide from said surface of said substrate while under said continuous  
4 vacuum, and at least one interior chamber adapted to deposit said metal on said  
5 surface of said substrate while under said continuous vacuum.

1 13. (Original) The apparatus of claim 12 further comprising at least one interior  
2 chamber adapted to heat said substrate.

1 14. (Previously Amended) The apparatus of claim 12 wherein said apparatus is  
2 adapted to transfer said substrate between said interior chamber adapted to remove

3 said oxide from said surface of said substrate and said interior chamber adapted to  
4 deposit said metal on said surface of said substrate without breaking said continuous  
5 vacuum.

1 15. (Original) The apparatus of claim 14 wherein said substrate is a silicon  
2 substrate.

1 16. (Original) The apparatus of claim 15 wherein said apparatus is adapted to  
2 remove said oxide from said surface of said substrate using a nitrogen trifluoride  
3 cleaning process.

1 17. (Original) The apparatus of claim 16 wherein said metal is cobalt.

1 18. (Original) The apparatus of claim 17 wherein said interior chamber adapted  
2 to deposit said metal on said surface of said substrate is a vapor sputtering device.

1 19. (Original) The apparatus of claim 18 wherein said apparatus is further  
2 adapted to transfer said substrate to said heating chamber from said metal  
3 deposition chamber.

1 20. (Original) The apparatus of claim 19 wherein said silicide is cobalt silicide.

- 1 21. (Previously Added) A system for selectively forming a silicide on a surface of  
2 a semiconductor substrate comprising:  
3 said semiconductor substrate having said surface, a portion of said surface  
4 having silicon thereon and a portion of said surface having an insulator  
5 thereon, said surface further having an oxide thereover;  
6 a chamber;  
7 at least one pump adapted to evacuate said chamber to maintain a continuous  
8 vacuum in said chamber;  
9 a chemical agent input into said chamber adapted to remove said oxide from  
10 said surface of said substrate while said chamber is under said continuous  
11 vacuum;  
12 a reactor in said chamber, said reactor adapted to deposit a metal onto said  
13 silicon and insulator portions on said substrate surface while under said  
14 continuous vacuum;  
15 a heating element, said heating element adapted to heat said substrate to an  
16 elevated temperature to form a silicide on said substrate surface over the  
17 silicon portion by reaction with the metal deposited thereon, while the metal  
18 remains unreacted over the insulator portion; and  
19 an etchant to remove unreacted metal from the substrate surface while leaving  
20 said silicide over portions of said semiconductor substrate.

1 22. (Previously Added) The system of claim 21 wherein said chamber comprises  
2 a plurality of interior chambers, at least one interior chamber adapted to remove  
3 said oxide from said surface of said substrate while under said continuous vacuum,  
4 and at least one interior chamber adapted to deposit said metal on said surface of  
5 said substrate while under said continuous vacuum.

1 23. (Previously Added) The system of claim 22 wherein said apparatus is  
2 adapted to transfer said substrate between said interior chamber adapted to remove  
3 said oxide from said surface of said substrate and said interior chamber adapted to  
4 deposit said metal on said surface of said substrate without breaking said continuous  
5 vacuum.

1 24. (Previously Added) The system of claim 21 wherein said metal is cobalt.

1 25. (Previously Added) The system of claim 21 wherein said chemical agent is  
2 selected from the group consisting of nitrogen trifluoride and argon.

1 26. (Previously Added) The system of claim 21 wherein said reactor for  
2 depositing said metal on said surface of said substrate is a vapor sputtering device.

1 27. (Previously Added) The system of claim 21 wherein said heating element  
2 resides within said chamber.

1 28. (Previously Added) The system of claim 21 wherein said heating element is  
2 external thereto said chamber.

1 29. (Previously Added) The system of claim 21 wherein said unreacted cobalt is  
2 removed using an etchant comprising hydrogen peroxide and sulfuric acid.

1 30. (Previously Added) An apparatus in combination with a semiconductor  
2 substrate for selectively forming a silicide thereon a surface of said semiconductor  
3 substrate comprising:

4 a portion of said semiconductor substrate surface having silicon thereon and a  
5 portion of said surface having an insulator thereon, said surface further  
6 having an oxide thereover;

7 a chamber;

8 at least one workpiece holder within said chamber adapted to hold said  
9 semiconductor substrate;

10 at least one pump adapted to evacuate said chamber to maintain a continuous  
11 vacuum in said chamber;

12 at least one line operatively connected between said at least one pump and said  
13 chamber for evacuating said chamber;  
14 at least one input line adapted to provide a chemical agent into said chamber  
15 while in said continuous vacuum, said chemical agent adapted to remove  
16 said oxide from said surface of said substrate;  
17 at least one output line adapted to remove said cleaning agent and said removed  
18 oxide from said chamber;  
19 a reactor in said chamber, said reactor adapted to deposit a metal onto said  
20 silicon and insulator portions on said substrate surface while in said  
21 continuous vacuum;  
22 a heating element, said heating element adapted to heat said substrate to an  
23 elevated temperature to form a silicide on said substrate surface over the  
24 silicon portion by reaction with the metal deposited thereon, while the metal  
25 remains unreacted over the insulator portion; and  
26 an etchant to remove unreacted metal from the substrate surface while leaving  
27 said silicide over portions of said semiconductor substrate.